National Pre-Hospital & Hospital Data Integration Listening Session Summit

Office of EMS, National Highway Traffic Safety Administration

NEMSIS TAC

NEMSIS
BETTER DATA. BETTER CARE.

NHTSA's National EMS Information System

- **Documentation standard** for local EMS patient care reports
- **Data element dictionary** for point of care collection
- **Compliance testing** for ePCR software
- Facilitation of **interoperability and exchange standards**
- Collection of select data into the **National EMS Database** from every EMS activation
  - Online National EMS Database for research and & surveillance

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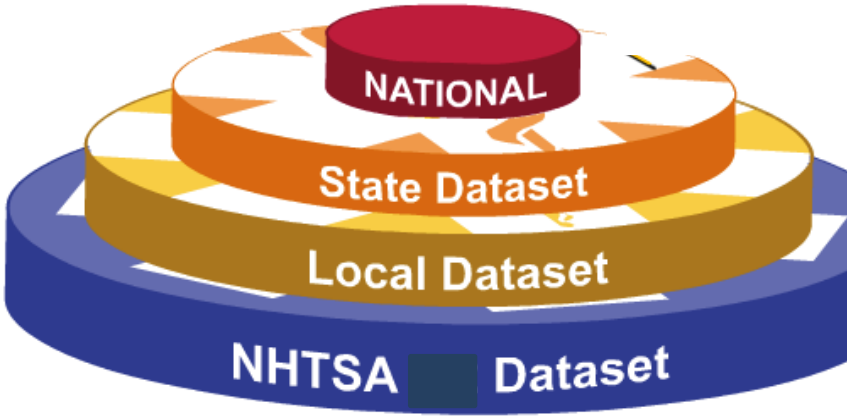
Database Structure

NEMSIS v3 Web Services Guide



NEMSIS V3 Schematron Guide

Legend
Dataset Level: N National S State D Deprecated
Usage: M = Mandatory , R = Required , E = Recommended, or O = Optional
Attributes: N = Not Values, P = Pertinent Negatives , L = Nillable, and/or C = Correlation ID

eVitals

1 : M	eVitals.VitalGroup								C
1 : 1	eVitals.01 - Date/Time Vital Signs Taken	N	S	R	N, L				
1 : 1	eVitals.02 - Obtained Prior to this Unit's EMS Care	N	S	R	N, L				
1 : 1	eVitals.CardiacRhythmGroup								C
1 : M	eVitals.03 - Cardiac Rhythm / Electrocardiography (ECG)	N	S	R	N, L, P	C			
1 : 1	eVitals.04 - ECG Type	N	S	R	N, L				
1 : M	eVitals.05 - Method of ECG Interpretation	N	S	R	N, L	C			
1 : 1	eVitals.BloodPressureGroup								
1 : 1	eVitals.06 - SBP (Systolic Blood Pressure)	N	S	R	N, L, P				
0 : 1	eVitals.07 - DBP (Diastolic Blood Pressure)	S	E	N, L, P					
1 : 1	eVitals.08 - Method of Blood Pressure Measurement	N	S	R	N, L				
0 : 1	eVitals.09 - Mean Arterial Pressure	O							
1 : 1	eVitals.HeartRateGroup								
1 : 1	eVitals.10 - Heart Rate	N	S	R	N, L, P				
0 : 1	eVitals.11 - Method of Heart Rate Measurement	O							
1 : 1	eVitals.12 - Pulse Oximetry	N	S	R	N, L, P				
0 : 1	eVitals.13 - Pulse Rhythm	O							
1 : 1	eVitals.14 - Respiratory Rate	N	S	R	N, L, P				
0 : 1	eVitals.15 - Respiratory Effort	O							
1 : 1	eVitals.16 - End Tidal Carbon Dioxide (ETCO2)	N	S	R	N, L, P				
0 : 1	eVitals.17 - Carbon Monoxide (CO)	S	E	N, L, P					
1 : 1	eVitals.18 - Blood Glucose Level	N	S	R	N, L, P				
1 : 1	eVitals.GlasgowScoreGroup								
1 : 1	eVitals.19 - Glasgow Coma Score-Eye	N	S	R	N, L, P				
1 : 1	eVitals.20 - Glasgow Coma Score-Verbal	N	S	R	N, L, P				
1 : 1	eVitals.21 - Glasgow Coma Score-Motor	N	S	R	N, L, P				
1 : M	eVitals.22 - Glasgow Coma Score-Qualifier	N	S	R	N, L	C			
0 : 1	eVitals.23 - Total Glasgow Coma Score	S	E	N, L, P					

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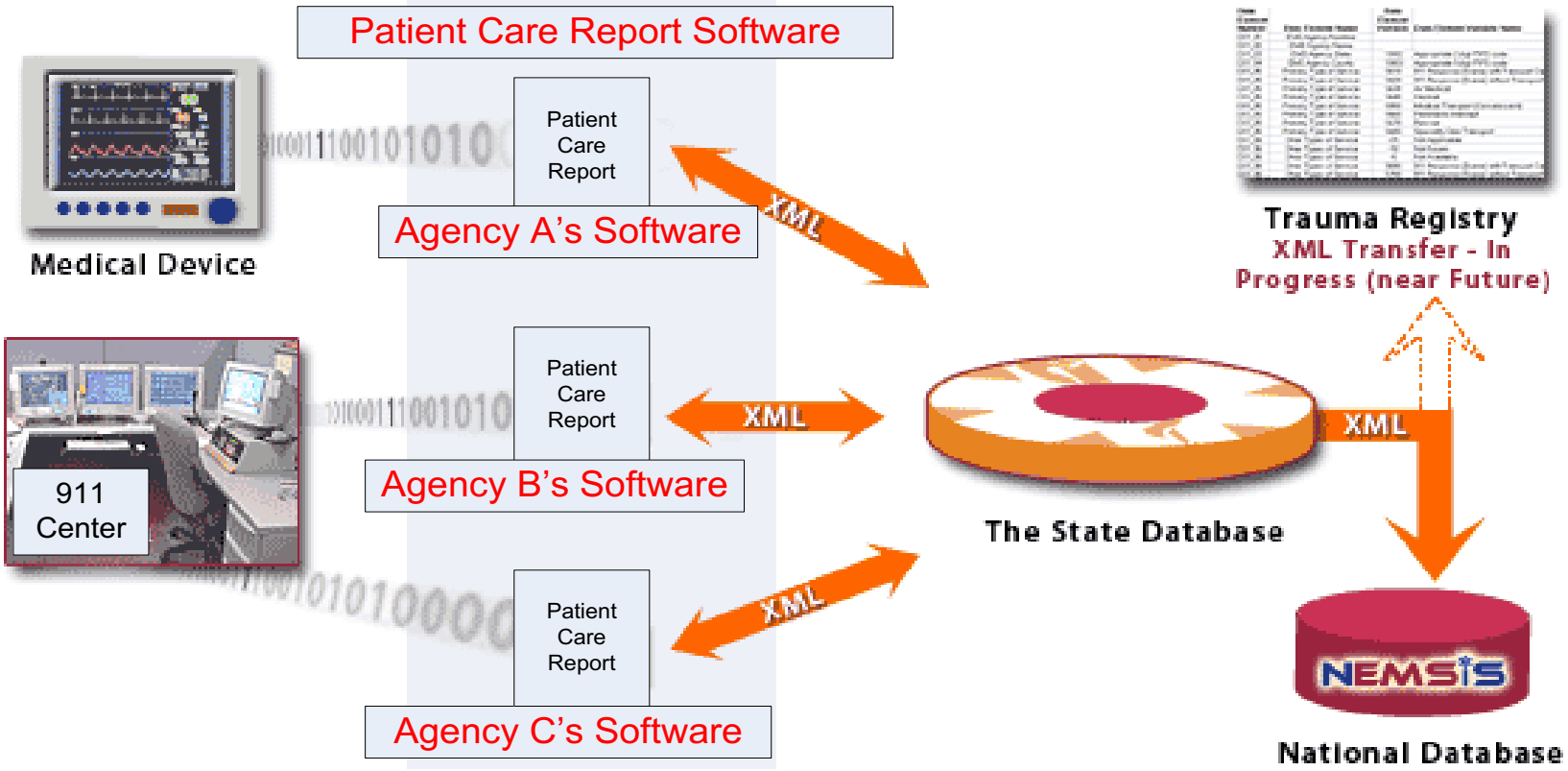
THE PORTABILITY OF DATA - the NEMSIS STANDARD.



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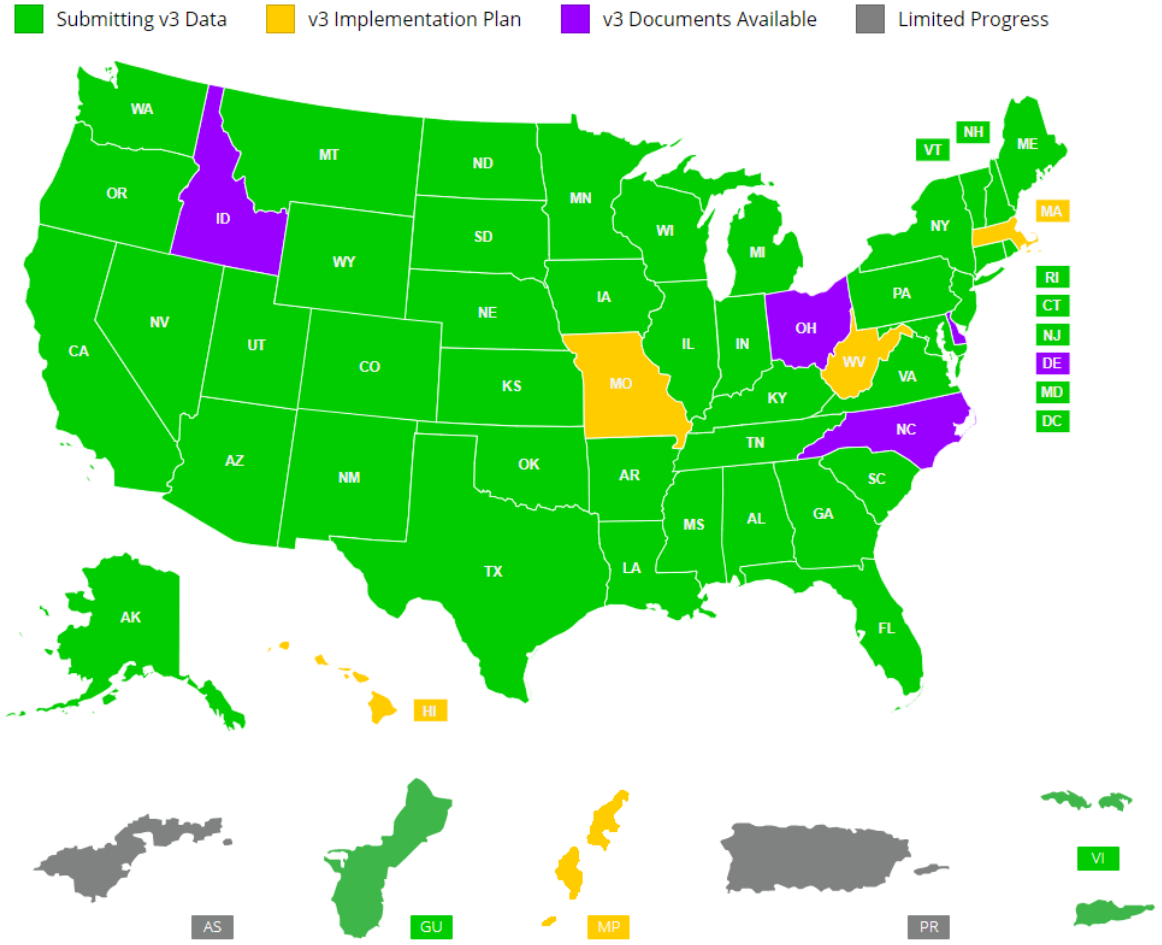
States and Territories Submitting to the National EMS Database



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National Public-Release Research Dataset

Statistical Year	Reporting States[1]	Reporting Agencies[2]	Number of Events	Treated and Transported 911 Response[2]
2009	26	1,673	5,767,090	3,367,668
2010	31	3,529	9,874,748	4,874,061
2011	35	5,395	14,371,941	7,701,605
2012	43	6,415	19,831,189	10,733,925
2013	45	8,183	23,897,212	12,595,958
2014	48	8,785	25,835,729	13,769,286
2015	49	10,137	30,206,450	15,729,516
2016	49	9,993	29,919,652	15,361,777
2017	35	4,016	7,907,829	4,233,046
2018	43	9,599	22,532,890	10,675,178

[1] Number of reporting states and territories of the United States.
[2]Only including the events that are 911 calls, treated and Transported by EMS.

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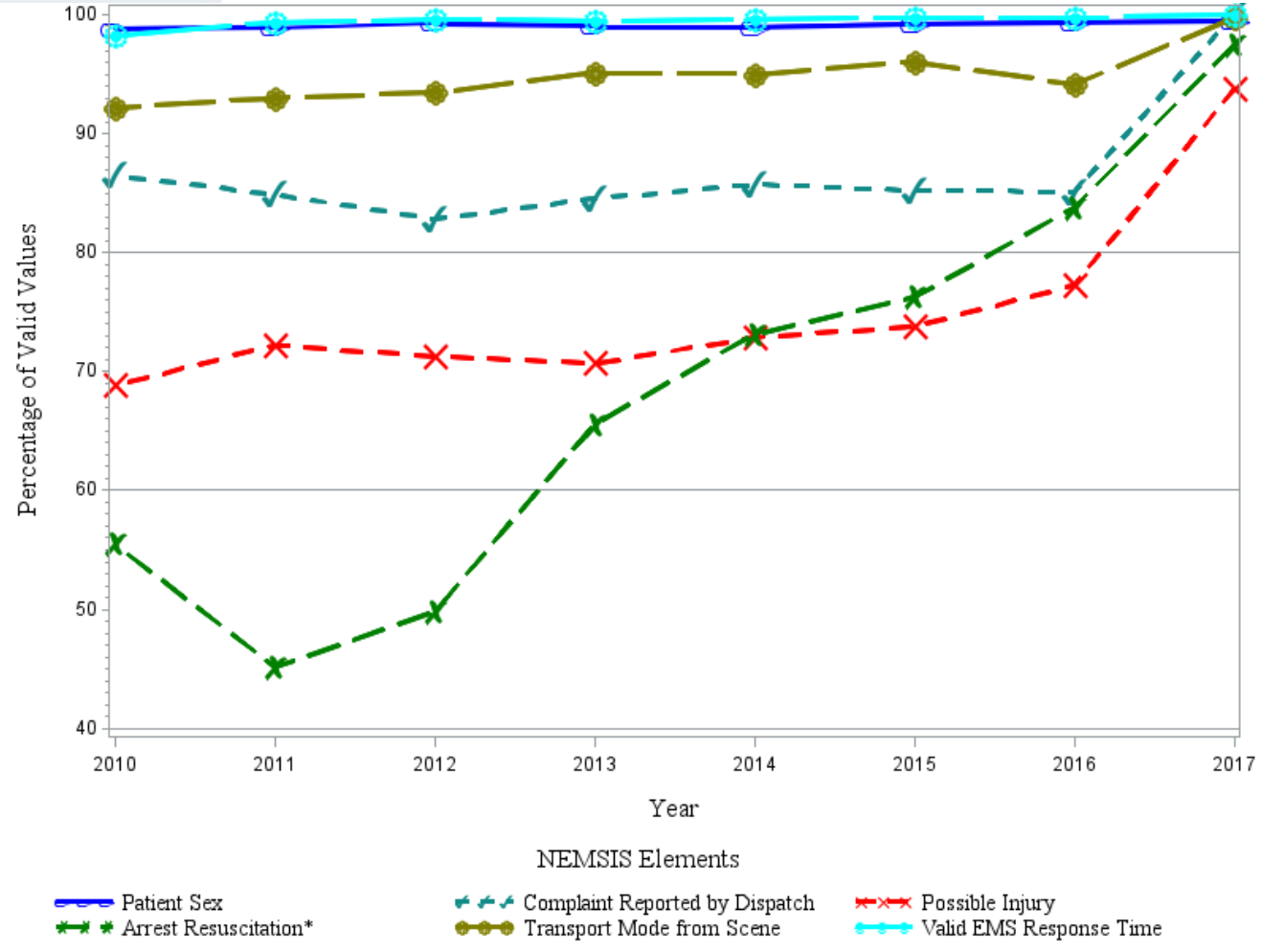
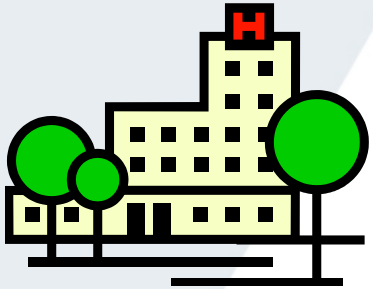
2019: 31,650,132 (as of 1/27/2020)

Ensure Data Quality

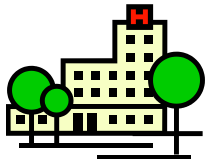


NEMSIS Support of HIE



Hospital

1. Patient Care Report (fwd)



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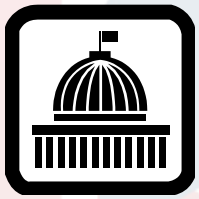
3. Patient Outcome Report

1. Patient Care Report

5. NEMSIS Dataset



State

Vehicle

2. Trip Report

Agency

4. EMS Incident Report

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CDA: ePCR Ambulance to ED

ANSI/HL7 CDAR2L3IG EMSRUNRPT, R1-2014
6/27/2014

HL7 Implementation Guide for CDA® Release 2 – Level 3: Emergency Medical Services; Patient Care Report, Release 1 – US Realm

June 2014

Sponsored by:
Clinical Interoperability Work Group
Structured Documents Work Group

Plan for NEMSIS Version 3.5.0

- Problem
  - ANSI approved guide is a “one-off” that hospitals did not want to implement.
- Course Correction
  - Manipulate the CMS approved CCD to contain NEMSIS elements
    - Can support Level-1 and level-3 implementations
  - Utilize the CMS Unstructured Document as a “wrapper” for a PDF
  - Utilize HL7 V2 implementation

CCDA NEMSIS eOutcomes

CDAR2_IG_EMS_HOSPOUTCOMESRPT_R1_D1_2016JAN

HL7 CDA® R2 Implementation Guide: Emergency Medical Services Hospital Outcomes Report, Release 1

January 2016

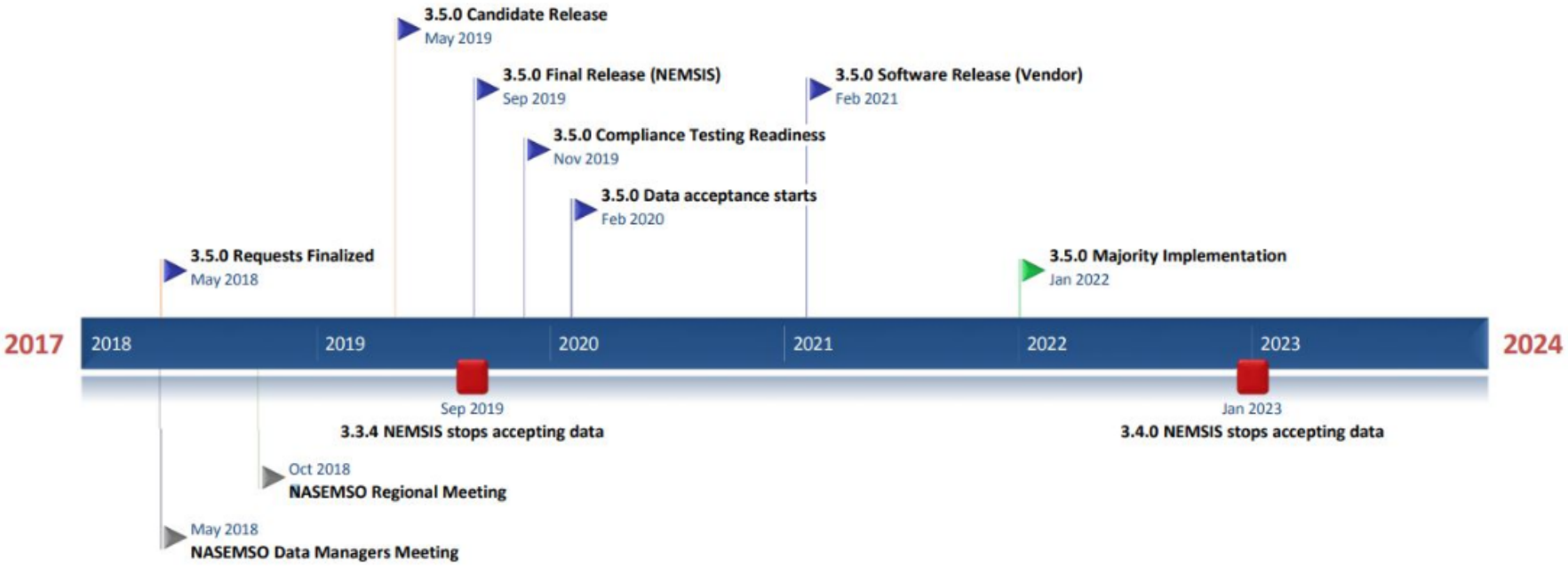
HL7 Normative Ballot

Sponsored by:
Clinical Interoperability Work Group
Emergency Care Work Group
Structured Documents Work Group

Plan for NEMSIS Version 3.5.0

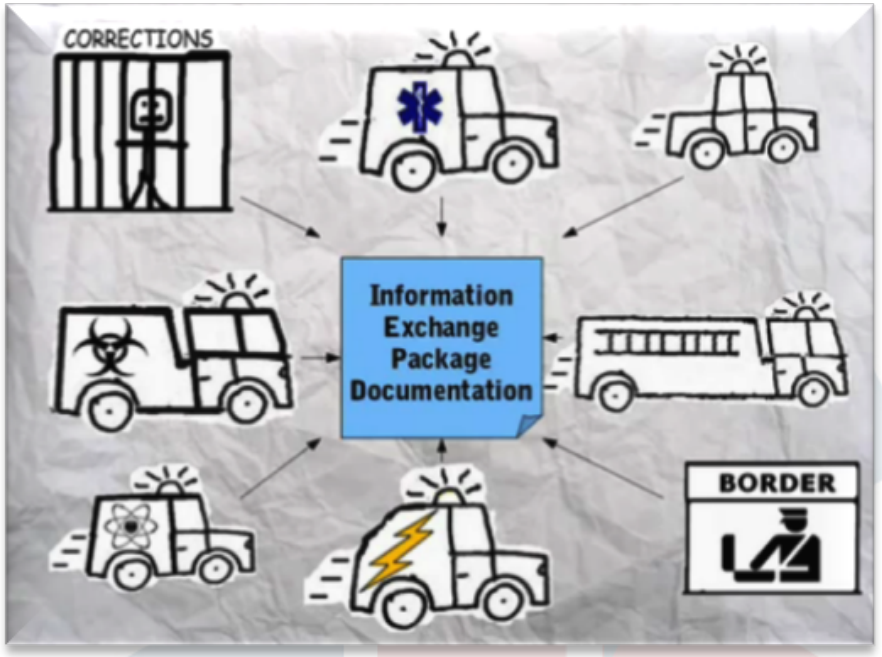
- Problem
  - HL7 ballot defeated - was a “one-off” that hospitals did not want to build to.
- Course Correction
  - Develop implementation guide for selected Patient Discharge Summary elements…and vendors standardize translation to NEMSIS
  - Develop in FHIR with vendor translation
  - Use existing “query-based” models (CareQuailty)

NEMSIS V3.5.0 Timeline



Beyond Health Level 7

- **Harmonization with other Standards**
  - Justice Domain
  - EDXL-TEP
  - NIEM
- **Facilitate Standards**
  - CAD
  - Medical Devices
  - AACN (VEDS)
- **Introduce Modules**
  - Air Medical
  - Critical Care
  - Community Paramedicine/Mobile Integrated Healthcare



Questions?

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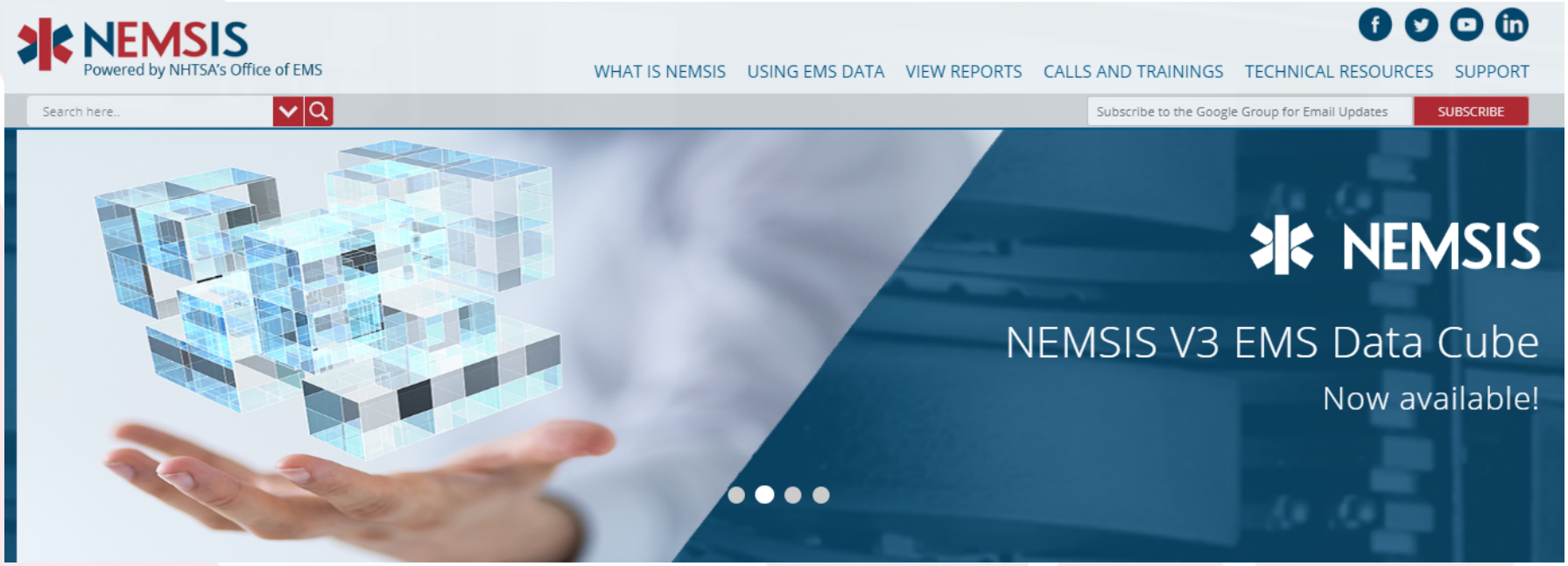
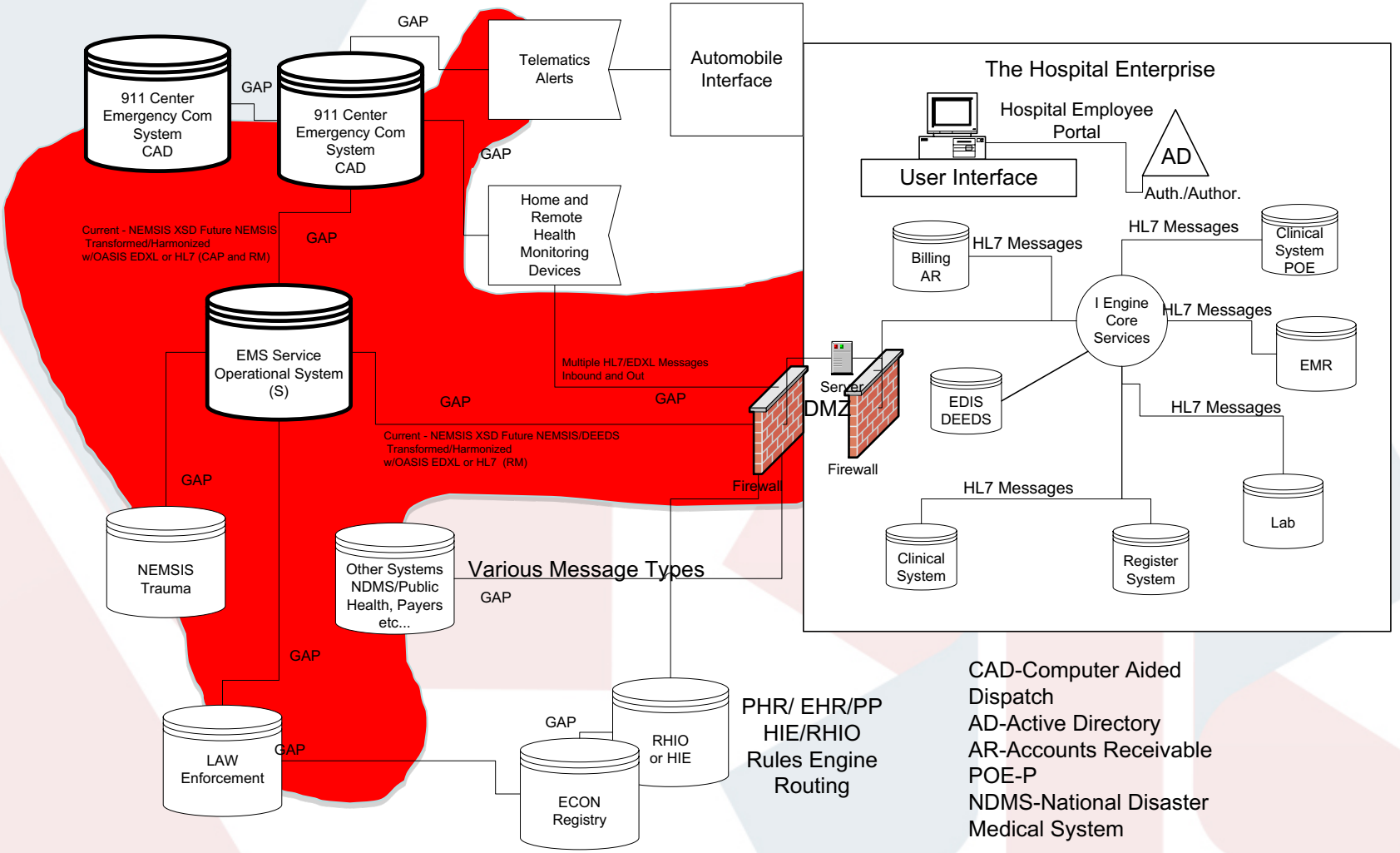


Context Diagram-Conceptual Information Flow



PHR/ EHR/PP
HIE/RHIO
Rules Engine
Routing

CAD-Computer Aided Dispatch
AD-Active Directory
AR-Accounts Receivable
POE-P
NDMS-National Disaster Medical System

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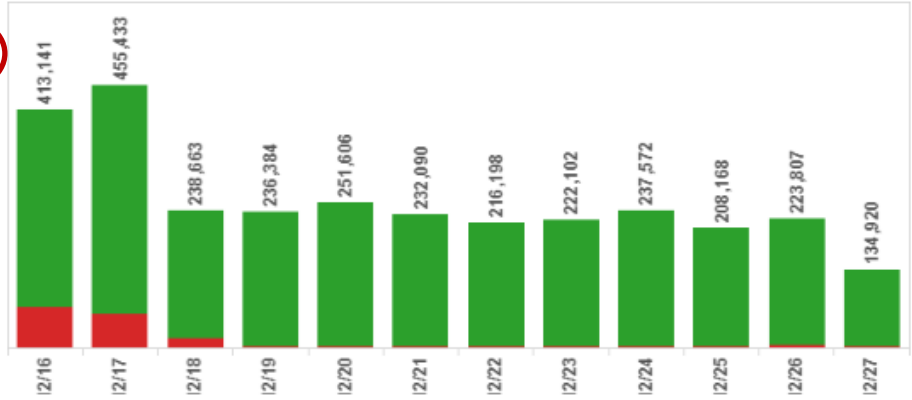
Submissions

Count of Submissions	3,070,084
Count of Submissions Accepted	2,899,379
Count of Submissions Rejected	170,705
Count of Submission Errors	170,867

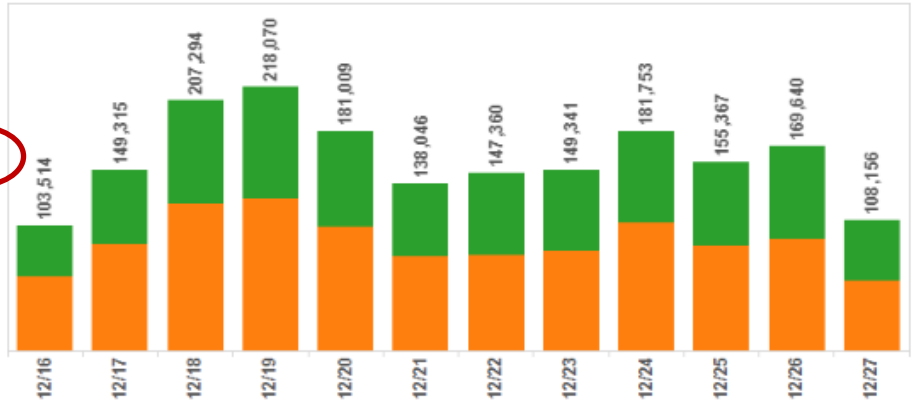
Submissions Accepted vs Rejected



Patient Care Reports (PCR) Processed

Count of Activations	1,908,865
Count of Activations with Violations	1,078,906
Count of Violations for all Accepted Activations	1,584,458
Violations Per Activation	0.8
Average Activations per Accepted File	1.1
Count of PCRs Resubmitted	228,700
Submission Lag 25% (hours)	68.7
Submission Lag 50% (hours)	713.7
Submission Lag 75% (hours)	4,712.6

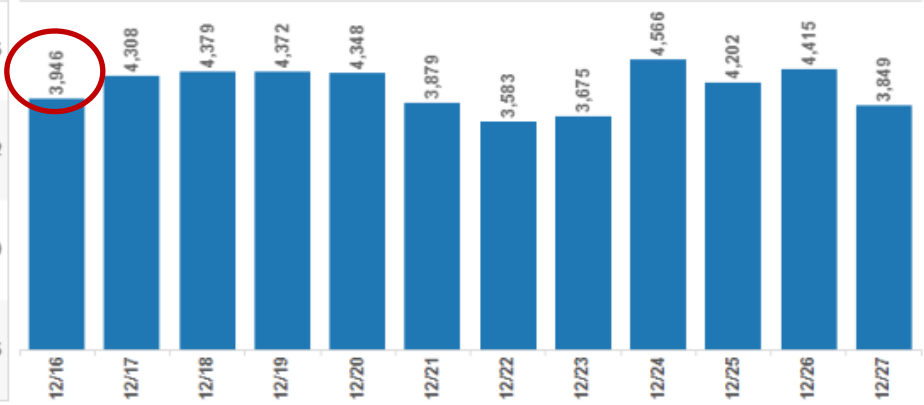
PCRs Processed With & Without Schematron Warnings



Agencies

Count of Active Agencies	6,146
Count of Agencies Submitted	142
EMS Agency Demographic Files Rejected	2,789
EMS Agency Resubmissions	186

Active EMS Agencies per Day



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